

Name: \_\_\_\_\_

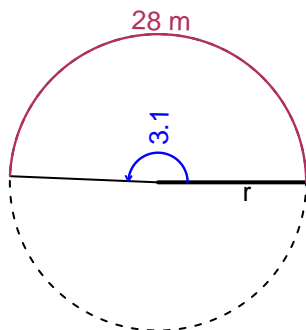
Date: \_\_\_\_\_

## Trig Final (TEST v620)

- You can use a calculator (like [Desmos](#))
- You should have a unit-circle with special angles and coordinates marked.

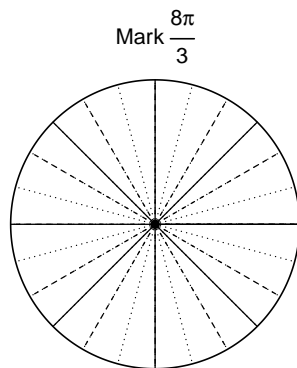
### Question 1

In the figure below, we see a circle and a central angle that subtends an arc. The arc length is 28 meters. The angle measure is 3.1 radians. How long is the radius in meters?

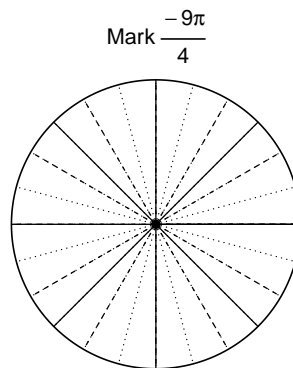


### Question 2

Consider angles  $\frac{8\pi}{3}$  and  $-\frac{9\pi}{4}$ . For each angle, use a spiral with an arrow head to **mark** the angle on a circle below in standard position. Then, find **exact** expressions for  $\cos\left(\frac{8\pi}{3}\right)$  and  $\sin\left(-\frac{9\pi}{4}\right)$  by using a unit circle (provided separately).



Find  $\cos(8\pi/3)$



Find  $\sin(-9\pi/4)$

**Question 3**

If  $\sin(\theta) = \frac{-72}{97}$ , and  $\theta$  is in quadrant IV, determine an exact value for  $\tan(\theta)$ .

**Question 4**

A mass-spring system oscillates vertically with a frequency of 5.86 Hz, an amplitude of 7.12 meters, and a midline at  $y = 3.2$  meters. At  $t = 0$ , the mass is at the midline and moving down. Write an equation to model the height ( $y$  in meters) as a function of time ( $t$  in seconds).